

**AB-10 - Paper**

**Creating Job Families Based on Relative Importance versus Absolute Time Spent Ratings**

**Rita Patel**

**U.S. Office of Personnel Management**

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**Paul D. Usala**

**U.S. Immigration & Naturalization Service**

**Brian S. O'Leary**

**U.S. Office of Personnel Management**

**Introduction**

Job classification is an important aspect of personnel psychology that serves as a foundation for a variety of personnel functions. *Positions* are classified into *jobs*, which in turn are classified into higher levels called *job families*. The literature reports a wide range of objectives and potential uses of job families such as job placement, personnel classification, career development and training, and job evaluation for broadbanding and determining pay structures (Pearlman, 1980). Job classification has also been applied to the problem of combining samples across jobs to obtain a large enough sample size for validation studies and to the problem of applying previous validity results to new jobs or situations such as validity generalizations (Pearlman, 1980).

Aggregating jobs into higher level job families simplifies personnel work by bringing out the similarities and differences between job attributes so that general statements can be made about broader groups of jobs (Pearlman, 1980). These broader job groupings or families may then serve as the unit of analysis for developing selection tests, training or development plans, or performance standards. For example, instead of developing unique performance standards for every employee in the organization, job analysis data can be used to identify groups of jobs that share similar tasks or competencies. Based on similarity, a common appraisal form may then be developed for each job family or group, thereby reducing the number of appraisal standards needed.

Job analyses build the foundation for developing job families. As such, two aspects of job analysis methods determine the meaningfulness of cross-job comparisons to form job families: 1) the behavioral and technical specificity of the items rated, and 2) the kind of metric produced by the rating scales and rater instructions (Harvey, 1991). In order for jobs to be comparable, they must be rated on the same tasks at the same level of breadth or specificity, and they must be rated on the same scale. Cross-job comparisons cannot be meaningful if jobs are rated on non-overlapping tasks or if different rating scales are used to describe each job under study (Harvey, 1991). In other words, incomparable content domain or incomparable rating scales render cross-job comparisons meaningless.

Researchers commonly use Relative Time Spent (RTS) ratings in job analysis questionnaires. Harvey (1991) has argued against the use of RTS ratings in favor of Absolute Time Spent (ATS) ratings. RTS ratings allow only within job comparisons because tasks are rated on importance or time spent relative to other tasks within the *same* job. On the other hand, ATS ratings provide a more comprehensive description of job similarity when making cross-job level comparisons because ratings of importance or time spent are made on tasks based on Harvey (1991) suggests that this relative versus absolute rating distinction is a serious problem confronting job analysis because statistical analysis of job ratings cannot discern the difference between relative and absolute frame references. He believes that relative ratings provide ipsative information, and "at best, all they tell us is that for a given job, a certain item has relatively more of an attribute being rated than other items on that job that receive higher ratings" (pp. 83).

Harvey's arguments are logical and make theoretical sense. To date, however, no study has empirically compared job families determined by relative time spent (RTS) versus absolute time spent (ATS) ratings. The purpose of the present study is to illustrate the similarities and differences in job families based on relative time spent versus absolute time spent ratings. Sanchez and Fraser (1992) found importance and time spent to be moderately correlated, and Freidman (1990) found redundancy between relative time spent and importance rating scales. If

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in fact, relative time spent and importance ratings are redundant, then importance ratings can be used as a proxy for relative time spent to analyze the similarities and differences among job families.

## Method

Data used for this analysis were a component of a large governmentwide occupational analysis of 119 professional/administrative occupations. This study was conducted using a multipurpose, survey-based occupational analysis approach to collect information from incumbents and supervisors on many occupations for a wide range of HRM functions (Pollack, Simons, & Patel, in progress). The foundation of this approach is the common language (i.e., common tasks and competencies) used to describe all occupations included in the study.

## Subjects

Incumbents and supervisors from each occupation were surveyed. The sampling plan for this study was designed to produce representative data for 119 Federal professional and administrative occupations. Surveys were sent to 104,960 incumbents and 36,920 supervisors. Surveys were completed and returned by 37,345 incumbents (36% response rate) and 9,544 supervisors (26% response rate). The final sample included sufficient data to provide interpretable results for 105 of the 119 occupations included in the study. Of the 105 occupations, 98 occupations had ratings provided by at least 10 incumbents, and at least 10 supervisors. Data from 98 occupations were analyzed to form job families.

## Survey Instrument

There were three forms of the survey, one incumbent form and two supervisor forms, which included task and competency sections, and either an organizational assessment or a classification section. The items in each section were identical across the different forms of the survey; however, the rating scales for the task and competency sections differed across the three surveys. Specifically, employees rated tasks on *Absolute Time Spent* (ATS) and competencies on *Importance* and *Need for Training*.

Supervisors rated tasks on Importance in both supervisor forms; they rated competencies on *Importance* and *Need for Training* in Form S1 and on *Required at Entry* and *Distinguishing Value* in Form S2. Importance ratings on tasks ranged from 0=Not Performed, to 1=Not Important, to 5=Extremely Important. ATS ratings of tasks ranged from 0=Not Performed, to 1=Every few months to yearly, to 5=Hourly to many times each hour. Incumbents and supervisors rated a total of 317 general tasks, 44 general competencies, and 35 technical competencies. For the purpose of this study, only ATS and Importance (or RTS) ratings of tasks were considered.

## Procedure

Analyses were performed on 98 occupations. Harvey (1991) has recommended using descriptive, dimension-oriented techniques for grouping jobs. He advocates Q-factor analysis over hierarchical cluster analysis (HCA), which is limited because 1) it produces only independent cluster solutions, regardless of the actual latent structure of the data, 2) there has never been a definitive rule for determining the correct number of clusters, and 3) a variety of algorithms available for computing HCA results in very different cluster solutions. Several researchers have heeded Harvey's advice, and have found alternate methods for determining job families. Colihan and Burger (1995) and Kubisiak, Borman, and Hanson (1998) used a hybrid technique that combines the Q-factor approach with HCA to produce meaningful results.

Colihan and Burger (1995) conducted a Monte-Carlo study in which they used computer generated data sets designed to simulate typical job analysis situations. Each data set contained 300 profiles, each with ratings on 240 tasks. The 300 profiles were constructed such that they would form six job families with 50 profile each. They tested the accuracy of job classification using various grouping strategies such as cluster analysis (Ward's minimum variance, average linkage, and k-means technique), Q-type factor analysis, and the hybrid approach. They found that as measurement and the amount of overlap between job families increased, hybrid techniques and Q-factor type analysis were more robust to these effects, were superior in terms of identifying the correct number of job families present in the data, and correctly classified jobs into those job families.

## Results/Discussion

Using Colihan and Burger's (1995) hybrid technique which combined Q-type factor analysis with cluster analysis, job families were developed for ATS task ratings, and RTS task ratings. Based on initial Q-factor analysis results, eigen values were examined to determine the number of job families. RTS task ratings resulted in 7 job families, and ATS task ratings resulted in 6 job families. Eight and six job families were also developed

from the RTS ratings for comparing solutions. Eight job families developed from RTS or importance ratings. Comparison of the seven-job families results and the eight-job families results showed a more logical pattern for the eight-job families results. The eight job families are: 1) Program Management and Analysis, 2) Environment and Recreation Planning, 3) Investigation and Legal Enforcement, 4) Social Science and Education, 5) Human Resources and Personnel Administration, 6) Benefits and Claims Examining, 7) History and Arts Information, and 8) Business and Financial Operations.

In addition to the six-job families solution, five- and seven- job families were developed from ATS ratings for comparing solutions. The ATS results suggested one less job family in the solution. Comparisons of the six-job families and seven-job families suggested that the seven-job families solution was more logical. The seven job families are: 1) **Nameless**, 2) Investigations and Legal Enforcement, 3) Social Science and Education, 4) Human Resources and Personnel Administration, 5) Benefits and Claims Examining, 6) Business and Financial Administration, and 7) Program Management and Analysis.

Comparisons of the eight-job families resulting from the RTS or importance scales to the seven-job families resulting from the ATS show that families tended to be robust across rating scales with some exceptions. The **NAMELESS** family was much harder to interpret because it appeared to combine jobs from several families.

#### **Need more discussion of Job families, uses, and results.**

The logical pattern of job families for the importance ratings suggests that importance ratings may not be a good proxy for RTS. Even if there is redundancy between the two scales, it is not sufficient to make one scale useless. RTS should have provided more meaningless results than ATS because RTS ratings would have elicited information about tasks relative to other tasks *within* the job, not relative to other tasks *across* job.

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